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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,485	06/25/2003	Seiji Oda	WAKAB79.011AUS	3568

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EXAMINER	
DOUGHERTY, THOMAS M	

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 04/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/603,485	ODA ET AL.	
	Examiner	Art Unit	
	Thomas M. Dougherty	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicants' prior art figures 1 and 2A in view of Ebihara (JP 53-132988). The applicants prior art shows a crystal unit comprising: a crystal blank (2) having a hole (4) defined in at least one principal surface thereof, said crystal blank (2) having a region of a reduced thickness including said hole (4), said region serving as a vibrating region; excitation electrodes (5) disposed respectively on opposite principal surfaces of said crystal blank (2) in said vibrating region; extension electrodes (6) extending respectively from excitation electrodes (5) to respective opposite ends of one side of said crystal blank (2); and a casing (1) having a step formed therein; wherein said opposite ends of the one side of the crystal blank (2) are fixed to said step by a joining member (7).

Said crystal blank (2) comprises an AT-cut crystal blank (p. 2, l. 14 of disclosure) having a substantially rectangular shape, said one side comprising a shorter side of said crystal blank (2).

Said joining member (7) is made of an electrically conductive adhesive (p. 3, l. 9).

Conductive adhesive (7) comprises an electrically conductive adhesive mainly composed of epoxy resin or polyimides (p. 3. l. 17).

Said casing (1) is made of ceramics (p. 1, l. 24).

The prior art figures do not show said crystal blank with a notched portion defined therein between said one side and said vibrating region, said notched portion extending from at least one transverse edge of said crystal blank in a transverse direction of said crystal blank; also not shown is the crystal blank with a pair of said notched portions extending from respective transverse edges of said crystal blank.

Ebihara shows (fig. 2) a unit comprising: a piezoelectric material element (1) with a region serving as a vibrating region; excitation electrodes (not numbered) disposed respectively on opposite principal surfaces of said piezoelectric material element (1) in said vibrating region; extension electrodes (2a, 2b) extending respectively from excitation electrodes to respective opposite ends of one side of said piezoelectric element (1); and a casing (6) having a step formed therein; wherein said opposite ends of the one side of the piezoelectric material element are fixed to said step by a joining member (not numbered). Ebihara's piezoelectric material element (1) has a notched portion (7a) defined therein between said one side (e.g. side at 2a) and said vibrating region (central part), said notched portion (7a) extending from at least one transverse edge of said piezoelectric material element (1) in a transverse direction of said piezoelectric material element (1).

Said piezoelectric material element (1) has a pair of said notched portions (7a) extending from respective transverse edges of said piezoelectric material element.

Ebihara doesn't show a hole defined in at least one principal surface of a specific crystal blank having a region of a reduced thickness including said hole. It is not known what material he uses for his piezoelectric element.

It would have been obvious to one having ordinary skill in the art to employ the notched portion or portions as shown by Ebihara in the device of the applicants' prior art at the time of that invention, since the Ebihara notched design allows the device to obtain a good frequency temperature characteristic as noted by Ebihara in his PURPOSE. Note that this design in the applicants invention shares this goal with Ebihara and employs the same means to accomplish it.

Claims 1-5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicants' prior art figures 1 and 2A in view of Murata (JP 8-162875). The applicants prior art shows a crystal unit comprising: a crystal blank (2) having a hole (4) defined in at least one principal surface thereof, said crystal blank (2) having a region of a reduced thickness including said hole (4), said region serving as a vibrating region; excitation electrodes (5) disposed respectively on opposite principal surfaces of said crystal blank (2) in said vibrating region; extension electrodes (6) extending respectively from excitation electrodes (5) to respective opposite ends of one side of said crystal blank (2); and a casing (1) having a step formed therein; wherein said opposite ends of the one side of the crystal blank (2) are fixed to said step by a joining member (7).

Said crystal blank (2) comprises an AT-cut crystal blank (p. 2, l. 14 of disclosure) having a substantially rectangular shape, said one side comprising a shorter side of said crystal blank (2).

Said joining member (7) is made of an electrically conductive adhesive (p. 3, l. 9).

Conductive adhesive (7) comprises an electrically conductive adhesive mainly composed of epoxy resin or polyimides (p. 3. l. 17).

Said casing (1) is made of ceramics (p. 1, l. 24).

The prior art figures do not show said crystal blank with a notched portion defined therein between said one side and said vibrating region, said notched portion extending from at least one transverse edge of said crystal blank in a transverse direction of said crystal blank; also not shown is the crystal blank with a pair of said notched portions extending from respective transverse edges of said crystal blank.

Murata shows (fig. 4) a unit comprising: a piezoelectric material element (14) with a region (15) serving as a vibrating region; excitation electrodes (only 16 is shown as it's a top view) disposed respectively on opposite principal surfaces of said piezoelectric material element (14) in said vibrating region (15); extension electrodes (23, only one is shown, note that fig. 15 clearly shows electrodes on each surface) extending respectively from excitation electrodes (16) to opposite ends of said piezoelectric element (14); Murata shows their piezoelectric material element (14) having a notched portion (e.g. at 18)) defined therein between one side and said vibrating region (15), said notched portion extending from at least one transverse edge of said piezoelectric material element (14) in a transverse direction of said piezoelectric material element (14).

Said piezoelectric material element (14) has a pair of said notched portions extending from respective transverse edges of said piezoelectric material element.

The sum of areas of said extension electrodes (23) in a region from said notched portion to the sides (e.g. at 29, 30) of the piezoelectric material element (14) is substantially equal to an area of said region on said one principal surface.

Murata don't show a hole defined in at least one principal surface of a specific crystal blank having a region of a reduced thickness including said hole. It is not known what material he uses for his piezoelectric element.

It would have been obvious to one having ordinary skill in the art to employ the notched portion or portions as shown by Murata in the device of the applicants' prior art at the time of that invention, since the notched design and extension electrode configuration such that the sum of the areas of the extension electrodes would substantially equal an area of a region on one principal surface because it allows for an advantage whereby a small resonator with higher productivity is produced. See the ADVANTAGE section of the translated ABSTRACT.

Claim Rejections - 35 USC § 103

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the applicants' prior art figures 1 and 2A and of Ebihara (JP 53-132988) in view of Nishitani et al. (JP4-196613). Given the combined invention of the applicants' prior art and Ebihara, the combination doesn't show use of a joining member made of a brazing material comprising a eutectic alloy.

Nishitani et al. teach a joining member is made of a brazing material comprising a eutectic alloy in their piezoelectric resonator device.

They do not show notches or a hole in their resonator structure.

It would have been obvious to one having ordinary skill in the art to employ the joining member made of a brazing material comprising a eutectic alloy such as is shown by Nishitani et al. in the combined device of the applicants' prior art and Ebihara, at the time of the prior art invention, in order to reduce assembling processes and reduce the manufacturing cost as is noted by Nishitani et al. Note that only heating is required. See especially lines 17-23 in the translation of the CONSTITUTION.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining prior art reads on at least some aspects of the claimed invention.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

tmd

tmd

February 22, 2005

TOM DOUGHERTY
PRIMARY EXAMINER